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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Increasing in Numbers

See Page 234

A SCIENCE SERVICE PUBLICATION

# Kodak reports to laboratories on:

snapshotting in depth...getting rid of a stinker...the photomechanical armamentarium

## The stereo story

Your Kodak dealer is now in a position to offer you a top-quality stereo camera and viewer at a convenient price, and he may be able to extend payment terms that make it even more convenient.



The Kodak Stereo Camera tolerates and thrives on rough guesses. After you have decided which of the four available shutter speeds is appropriate, you set for "bright," "hazy," or "cloudy-bright," and this automatically matches the proper lens opening to the shutter speed selected. Similarly, you focus for "close-ups," "groups," or "scenes," and the great "depth" of the short-focus lenses takes care of you. A spirit level visible in the viewfinder indicates when the camera is level, for levelness is most important in stereo. There is no film threading because the end of your roll of No. 335 Kodachrome Film just drops into the take-up drum. The shutter is cocked automatically as you wind the film for each exposure. It can't be snapped again until the film is advanced.

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\$84.50 for the camera, \$12.75 for the Model I viewer or \$23.75 for the Model II; \$4.65 for a 20-stereo-pair roll of Kodachrome Film, including processing, mounting in Kodaslide Stereo Mounts, and return postage.

**This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are... serving laboratories everywhere**

## Act of beneficence



This envelope came in postmarked Hindi Prachar Sabha a while back but bearing no sender's name or address, inside or out. All that was in it was a sheet of thin paper on which some devoted soul and poor typist had summarized an article about how Thioacetamide ( $\text{CH}_3\text{CSNH}_2$ ), neat, manageable, water-soluble solid, can replace classical, gaseous, unpleasant hydrogen sulfide for the precipitation of insoluble sulfides.

We thank our self-effacing correspondent from the bottom of our heart. We also blush. Here we have been making Thioacetamide (Eastman 1719) for years and years and had never gotten around to mentioning how it can ease one of the oldest and most noxious occupational hazards of our valued friends, the inorganic analysts. (Whoever says that we wanted them to turn to emission spectroscopy so that another division would sell more photographic plates and film is being unkind and unrealistic.)

Thanks to the prod from India, we have now prepared a rather extensive abstract on Thioacetamide analytical procedures for various Group II and III metals. This we shall be pleased to send as a gift to anyone willing to take the trouble to write to Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company). Our friend in India, if he will but identify himself unequivocally, can also have 100 grams of the reagent for his trouble and postage outlay. To others we make a slight charge of \$3.00 for 25 grams, or \$1.50 for 10 grams.

## Empirical miracles

A fair share of the bread and jam for our children and of the gasoline for our stockholders' outboards comes from the graphic arts industry. That covers photoengraving, photolithography, photogravure,

screen process, and even a piece of straight commercial photography. The crafts are well established, committed to the principle of learning by doing. They do not fall all over themselves begging for advice from young scientists learned in quantum dynamics, yet somehow their product continually reaches new pinnacles of visual splendor.

We provide these practitioners with a complete line of sensitized materials, chemicals, lenses, filters, and auxiliary equipment, with which they proceed to work their empirical miracles. Unintentionally buried for years from the eyes of all but the photomechanical trade, there may be some item capable of working a particular empirical miracle that you have wanted to perpetrate. Ever hear of Kodalith Transparent



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If you are working in a field in which it might be handy to know of such things, it's about time we offered you a free copy of the catalog that describes them. A new edition is just out.

Write Eastman Kodak Company, Graphic Arts Sales Division, Rochester 4, N. Y., and ask for "Kodak Materials for the Graphic Arts." If you find anything in it that evokes a glimmer of promise, write again for a free translation into non-photomechanical language and the name of the nearest dealer handling the product.

\*Finished picture can be split off from the film base.

\*\*High-precision two-dimensional dot array.

\*\*\*Gives a high-contrast positive direct from another positive, or a negative from a negative.

Prices quoted are subject to change without notice.

**Kodak**  
TRADE MARK

## PUBLIC HEALTH

# Flu Epidemic Likely

Health authorities suggest that this fall would be a good time to be vaccinated unless your doctor advises against it. Time for type A to return.

► AN INFLUENZA epidemic is likely to come this winter (1954-55).

Health authorities will not make predictions about such epidemics, especially this far in advance. But one of them did tell SCIENCE SERVICE that this fall would be a good time to get vaccinated against the disease, unless, of course, your doctor advises against it.

The Defense Department apparently thinks the same. An order has gone out for American servicemen throughout the world to be vaccinated before Nov. 15.

Here are reasons for expecting an influenza epidemic this coming winter: 1. Influenza epidemics are due to type A 'flu virus. This virus appears in cycles of about two years. We had no influenza A last winter. In 1952-53 we had an influenza epidemic, type A. Two years before that, in the winter of 1950-51, there was another influenza A epidemic.

2. There was a sharp outbreak of influenza A in June of this year in South Africa. In May and June there was a type A outbreak in Australia. In August influenza A hit the Philippines. This pattern of summer and early fall 'flu epidemics in those regions of the world has sometimes been followed by an epidemic in the United States the following winter.

Health authorities are watching closely to see what comes of those three epidemics. So far, there is no influenza in the United States. It is, of course, too early in the year for it. The last epidemic broke out in the first week of January, 1953. Actually, it had started earlier with cases at Fort Leonard Wood, Mo., at the end of November, 1952. Looking back, health and medical authorities realized that was the start of the epidemic. But as so often happens in influenza epidemics, the actual start was missed and only recognized after the epidemic had gotten into full stride.

The Armed Forces did not start vaccinating early enough that year. They found, looking back, that their vaccination of servicemen overseas and in special areas in the U. S. was not started until the epidemic had about reached its peak. That is why the Nov. 15 deadline has been set for vaccinations this year.

Influenza vaccine should be given about a month before the disease is likely to attack. It takes at least two and probably four weeks for the vaccine to build up immunity in the vaccinated person. But since the protection from the vaccine does not last too long, it is best to vaccinate as near the start of the 'flu season or expected epidemic as possible while still allowing that

month for the body to develop immunity.

The vaccine being given servicemen is made of equal parts of two A virus strains and one B virus strain. It is a little stronger than the one previously used or than the one prepared for civilian use. The whole problem of influenza vaccines and just how to make them most effective is still unsettled. One thing is known, however. That is, that it is futile to vaccinate against 'flu at the beginning of an epidemic. The vaccinating must be done several weeks before.

Influenza B comes in six-year cycles instead of the two-year cycles of influenza A. This virus causes local outbreaks, sometimes over a wide area, or sporadic cases. But it does not cause the large regional outbreaks that make an epidemic. For example, when influenza B is the virus of the year, there may be a lot of 'flu cases in one town and none in a neighboring town. Over the nation, there may be enough towns with sharp B outbreaks to bring up a large national total of cases. But the pattern is not that of an epidemic such as virus A causes.

This B virus was first recognized in 1940 when it was widely prevalent. It next appeared in numerous local outbreaks in 1945-46, and then again in 1951-52. That is, it started at the end of the years 1945 and 1951 and got into full swing in 1946 and 1952. We can expect the next influenza B outbreaks about January, 1958, if it continues to follow this pattern.

Influenza outbreaks and epidemics are not likely, however, to cause the havoc of the great world-wide, pandemic of influenza in 1917-1918. The very high mortality which made that epidemic so disastrous was due to the pneumonia and other infections that followed in the wake of the 'flu. With penicillin and other antibiotics to stop the secondary infections, it is highly unlikely that an influenza epidemic will ever again cause so many deaths.

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## CYTOLOGY

## Test-Tube Cells Replace Human Guinea Pigs

► HUMAN GUINEA pigs may be replaced in future disease studies by glass-grown cells, thanks to Elsa M. Zitcer, Relda Cailleau and Paul Kirk of the University of California.

Their achievement, the first serial cultivation of normal human cells directly on glass in liquid medium, is announced in *Science* (Sept. 24).

The growth of generation after genera-

tion of living bits of normal human beings in test tubes opens broad new vistas of research in virus diseases, cancer, and understanding of the cell.

Hela cancer cells have been cultivated this way, but classical serial cultivation of normal cells was previously limited to plasma clots in nutrient liquid. The cells could not be removed from plasma without killing them. Single generation serial cultivation of normal cells was possible, but standardization of material was impossible this way.

The key to the new technique appears to be adaptation of the cells to the clot first, giving time for adjustment to an artificial environment.

The method makes possible testing human viruses against normal human cells, getting in the laboratory much information unobtainable before except by infection of human volunteers. It may also be possible to grow viruses in human normal cells, to make better comparison of cancer and normal cells, to see what cancer-causing viruses do to these cells.

The technique opens a wide range of studies where information has been sketchy—cell nutrition, chemistry and differentiation.

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**JIG-SAW**—It is a scientific puzzle to put back together the skeleton of this Gila monster, prehistoric relative of the modern alligator. Working on the reassembly job are Dr. Stanley Olsen (left) of the Museum of Comparative Zoology, Harvard University, Walter Auffenberg, University of Florida graduate student who discovered the bones, and John Maxfield of the Museum staff.

## PSYCHOLOGY

# How You See Depth

► YOUR TWO eyes see the depth or distance between two objects in two different ways, experiments by Dr. Kenneth S. Ogle, of Mayo Clinic and the Mayo Foundation, show. The image you see with your left eye is slightly different from the one seen by your right eye. This is true because your two eyes are looking at the object from slightly different angles.

One way the eyes see depth, the one already familiar to scientists, is purely physiological. It depends upon the anatomical arrangement of the two eye retinas and the brain. It gives a quantitative sense of depth, that is, it tells you how much farther away one object is than another with which you are comparing it.

This method of depth perception is made use of in the ordinary stereoscopic, or 3-D, photographs. Such depth pictures are ordinarily taken with two cameras, or two lenses on a single camera, the lenses being

set up the same distance apart as are your two eyes.

It is then arranged for you to look at the photograph taken with the left camera with your left eye only, the picture from the right camera with your right eye. In this way the double photograph duplicates what you would have seen had you looked directly at the original scene.

The other kind of depth perception is a much vaguer experience, Dr. Ogle found. It tells you only that one object is nearer or farther away than another, but not how much. It depends, not so much on anatomical organization alone, as on your previous experience in judging distance and depth. It is helped when you run your eyes over the scene, letting them travel from one object to another.

Details of Dr. Ogle's experiments are reported in the *Journal of Experimental Psychology* (Oct.).

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## HERPETOLOGY

# Turtles Face Extinction

► THE ATLANTIC Green Turtle, the buffalo of the Caribbean, whose ancestors fed Columbus, is facing extinction, Dr. Archie Carr of the University of Florida told the American Institute of Biological Sciences meeting.

Protective laws are needed to save the rapidly disappearing southern turtle, Dr. Carr urged. The Atlantic Green Turtle, or chelonia, is becoming scarce quietly and without publicity.

This turtle played a role in the colonial history of the Caribbean, like that of the American buffalo on the Great Plains.

On the homeward leg of his fourth voyage to America, in May, 1503, Columbus was so impressed with the great flotillas of these turtles that he called their breeding spot, Las Tortugas, the Turtles. Thirteen years later, Ponce de Leon renamed the islands the Caymans, the name used today.

From that time on, "all early activity in the new world tropics—exploration, colonization, buccaneering, and even the maneuverings of naval squadrons," said Dr. Carr, "was in some way or degree dependent on the turtle."

Salted or dried, the turtles were readily used to replace depleted or infected beef supplies, and early colonial maritime captains saved more than one crew by using the turtle food as a quick rescue for scurvy.

"It was at once a staple and a luxury, a slave ration, and in soup and curries the pride of the menus of the big plantation houses," Dr. Carr added.

The turtle was big, abundant, available,

tasty and unique. But it was a one-footed animal. It fed on only one type of plant at the bottom of the sea.

The only needs of the huge herds of turtles were enough feeding and breeding space. They fed in shallow clear waters. Catching turtles was only a matter of waiting until they came ashore and then turning them on their backs.

Today, however, this once proud aristocrat, with a flair for the easy life, has lost most of its feeding places. The one nesting place that remained after civilization evicted the turtle was the Cayman Islands. This area is still the main source of green turtles for the American gourmet.

"But," warned Dr. Carr, "where 20 years ago most Caribbean shore was wilderness, aluminum roofing now shines in new clearings in seaside scrub. The people are breeding too fast for the turtles."

The Florida biologist believes that laws protecting the few remaining Caribbean breeding beaches used by these ancient mariners will save them from extinction.

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## INVENTION

# Machine Weighs Coins In a Monetary Whirl

► IF YOU think money slips through your fingers all too fast, you should see a new machine the U. S. Treasury Department has.

It weighs and sorts 18,000 coins an hour, spitting them into proper hoppers that separate the "light" coins from the "heavy" ones.

Developed by the National Bureau of Standards, the machine's coin-biting "teeth" take the form of a flywheel spinning at 3,000 revolutions a minute. A standard coin is held in this flywheel and coins to be tested are fed in automatically through the hub. When the coin's weight does not match the standard, the wheel vibrates and sensitive instruments can tell how "light" or "heavy" a coin is by measuring the vibration.

As a new coin is inserted, it forces the weighed coin out. Split-second timing insures that the ejected coin is shot into the proper hopper, *Automation* magazine reports.

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## METEOROLOGY

# Still Hurricane Season

**Weather patterns until middle of October show likelihood of formation of strong winds in the Gulf and off the coast of the West Indies.**

► THE HURRICANE season is not over yet. Weather maps predicting general weather patterns until mid-October give indications for the "probable formation of more hurricanes, both in the Gulf and sweeping across the southeastern United States, and off the northeastern coast of the West Indies, then swinging up off the Atlantic Coast," Jerome Namias, long-range weather expert of the U. S. Weather Bureau in Washington, D. C., sees.

The broad-scale atmospheric flow patterns until mid-October suggest that the paths of the Atlantic hurricanes are "closer to coastal areas than normal," Mr. Namias said.

However, he stressed that, as the season goes on, the prevailing westerly winds of the upper atmosphere will tend to work farther south. As they do this, hurricane paths will tend to be forced farther eastward as the tropical storms reach the latitudes of New England.

Mr. Namias said that the Weather Bureau long-range forecasts give only "highly general indications" of future weather, not specific predictions. The present forecast should not be used as an immediate warning of impending hurricanes. Rather it indicates the general conditions for breeding and steering the destructive tropical storms.

"I would be amazed," Mr. Namias said, "if there were not another hurricane formed, posing problems of predicting its path to forecasters somewhere along the coastal areas of the United States."

The 30-day weather forecasts are contained in three charts that show the outlook for temperatures, precipitation and pressures. The pressure chart shows the "principal cyclone track" over the Atlantic is closer to the East Coast than normal, as it has been since before the first of September. It was, however, farther east in the mid-September 30-day prediction than it was in the previous one.

The principal cyclone track shows the most likely paths of cyclonic storms, of which hurricanes are the most violent and destructive.

On the pressure chart for this long-range forecast, the track starts in the southern Atlantic, swings westward above Cuba, then northward near Bermuda and up the East Coast off Cape Hatteras and Newfoundland, finally passing near Norway.

One prong of the track starts in the Caribbean Sea, swings up to New Orleans, then across land to the Atlantic, where it joins the Atlantic track off Cape Hatteras.

Severe storms, and hurricanes, following the latter path, would lose much of their steam over the long land path across southeastern United States.

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## BOTANY

## Discovers Hybrid Plant Unlike Either Parent

► HYBRID PLANTS, which do not resemble either parent and may some day be classed as a new species, have been discovered by Dr. Reed Clark Rollins, director of the Gray Herbarium at Harvard University.

The description of what is believed to be the first natural plant hybridization reported was presented by Dr. Rollins at the Eighth International Botanical Conference in Paris.

Colonies of the plants, known as *Lesquerella*, were found in north central Tennessee. *Lesquerella* is a member of the mustard family and closely resembles the

yellow-flowered alyssum, golden-tuft, or basket-of-gold.

The existence of these hybrids, whose change-over from the characteristics of their parents probably occurred when man first settled the area 200 years ago, is of interest to scientists because most hybrids usually regain the appearance of one or the other of the parents.

"There is now evidence," Dr. Rollins stated, "that evolution is being given a major assist in the world of plants by the natural hybridization of existing species of a radically different kind."

All colonies found, some of which have moved 40 miles from the original parental species, live and thrive independently. The hybrid populations have become well established over many generations and appear to be well on their way to becoming completely separate from their original ancestors.

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## ASTRONOMY

## Comet Wirtanen Is Rediscovered

► A VERY faint comet known as Wirtanen Comet, first spotted in 1948, has been rediscovered by Dr. Hamilton M. Jeffers and Miss Elizabeth Roemer of Lick Observatory, Mt. Hamilton, Calif. The 18th magnitude comet is too faint to be seen except in the largest telescopes. It is in the constellation of Cancer, the crab.

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**STRANGE HYBRID**—The hybrid *Lesquerella* plant shown in the center has semi-oval seed pods different from either parent, shown on left and right. But the hybrid plants also bear seed pods somewhat similar to those of the parents. Existence of colonies of the different hybrids is unusual because it is the normal tendency of naturally-occurring plant hybrids to cross back and regain the characteristics of one or the other parent.

## MEDICINE

# Stomach Balloon Cools

**Running ice water into balloon would reduce temperature of heat stroke patient. Hot water would warm those suffering from cold. Heat or cold brought close to aorta.**

► **RUNNING COLD** or hot water into a balloon in the stomach can be life-saving for victims of sunstroke or the reverse condition of being nearly frozen.

This new, simple and safe method of quickly lowering or raising body temperature, which could also be used for operations on the heart and large blood vessels, is announced by Drs. H. H. Khalil and R. C. MacKeith of Guy's Hospital in the *British Medical Journal* (Sept. 25).

With the balloon in the stomach, the water is not absorbed into the blood. However, its cold or heat is brought close to the aorta and other big blood vessels which are located close to the stomach. In addition, the many blood vessels of the stomach wall bring much blood to be cooled or heated and thus help spread the cooling or heating effect throughout the body.

Success of the method was shown in the very first patient treated by it. This was a 16-month-old baby boy brought to the hospital suffering from pneumonia. The pneumonia was cured, but the baby had a paralytic fit and his temperature went back up to 105 degrees Fahrenheit. He was in a stupor, very sick and his skin was cold. In spite of repeated cold applications of the usual sort for five hours, his temperature never went below 103.5 Fahrenheit.

At this point, the doctors decided to try the stomach balloon method they had developed for low temperature studies on laboratory animals.

The small balloon was easily passed into the baby's stomach and about three ounces of ice water, at a temperature of about 32 to 39 degrees Fahrenheit, was slowly run in. After two minutes the water was withdrawn, by which time it had been warmed to about 80 degrees Fahrenheit.

Ice water was put in the balloon in the baby's stomach and withdrawn this way in small amounts for 68 minutes. After the first half hour, the baby came out of his stupor. His skin was warm except over his stomach where it was icy cold. At the end of 50 minutes, his temperature was down practically to normal (100.6 Fahrenheit rectally).

At the end of an hour, the baby was very lively, his skin felt normally warm and his condition was much improved. The treatment was then stopped. However, about four hours later he relapsed and his temperature had gone back to 103.6. His skin was cold, pale and gray and he was again in a stupor.

The tube and rubber balloon were again passed into his stomach and 12 changes of about four ounces each of ice water were given over the next hour. His temperature

came down and at the end of an hour and 15 minutes he was "taking milk by mouth with good appetite."

He has kept well and without fever since then.

This simple cooling method, the doctors point out, may be useful not only for patients suffering from heat stroke but also for those with high fevers due to infection or to brain disease. It might be used to cool patients for operations.

For warming men exposed to severe cold, it avoids the serious disadvantages of warming by heating the outside of the body. These disadvantages include increasing the oxygen demands of the surface tissues before the oxygen-carrying blood supply to them is adequate, and the fall in blood pressure that can come from the enlarging of little blood vessels in the skin before the general circulation has improved.

Certain changes for using the new method in grown-ups may be needed, the doctors point out.

The studies for which the method was first developed were done to find what effect the stress of very low temperatures had on the pituitary-adrenal gland mechanism. These showed that the stress response mechanism leading to release of the adrenal-stimulating pituitary hormone, ACTH, better known for its anti-arthritis effects, is checked by very low body temperatures, at least in rats. The adrenal gland cortex, however, still responds to ACTH injected into the veins even when the animal is chilled.

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## PSYCHOLOGY

## Pace Yourself For Long Pull

► **WITH SUMMER** holidays now over, most of us have a back to work (or school) feeling. Another year of work stretches before us and for some the prospect is dull, for others it is inviting.

However you feel about the prospect, this may be a good time to give some thought to the "stress disorders." They are the ailments and sicknesses that come when we are under too much stress and strain.

One authority lists nervousness and neuroses, arthritis, overweight, high blood pressure, gastric and duodenal ulcer, gout, coronary heart disease, asthma and bronchitis as some of the stress disorders.

They hit relatively young people, especially business executives. And they are almost always laid to the stress of overwork.

Work, by itself, however, is not necessarily harmful. The stress that is blamed for a heart attack or stroke came as a result of maladjustment, not of work itself. The maladjustment may have been related to the person's job or it may have been related to some other part of his life. In any case, stress disorders result from too much stress and too little tolerance.

In a report to the Industrial Hygiene Foundation, Dr. William P. Shepard of the Metropolitan Life Insurance Company points out that stress disorders are easier to prevent than to cure. His advice to the worker, especially the executive, is to learn to "pace" himself for the long pull, to adjust his speed to his load, to lighten his load by delegating responsibility to well-chosen subordinates.

Finally, he advises developing tolerance to pressure from above, whether it comes from a foreman, a board of directors or the worker's own conscience.

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## MEDICINE

## Awards for Health Aid To Babies and Soldiers

► **IT WAS**, in a way, babies' and servicemen's day at the honor luncheon in New York for the 1954 winners of the Albert Lasker Awards of the American Public Health Association.

Awards went to Dr. Leona Baumgartner, New York City health commissioner, best known for her work to improve health conditions for new babies and their mothers as well as for children generally; to Dr. John F. Enders, Harvard Medical School scientist whose work is helping toward conquest of mumps, measles and polio; jointly to Drs. Alfred Blalock and Helen B. Taussig, Johns Hopkins University, and Dr. Robert E. Gross, Harvard Medical School, famed for "blue baby" and "ductus" operations to correct congenital heart defects; and, in a group award, to the Streptococcal Disease Laboratory, Armed Forces Epidemiological Board, Francis E. Warren Air Force Base, Cheyenne, Wyo., under the directorship of Dr. Charles H. Rammelkamp Jr., of Western Reserve University, Cleveland.

Babies, children and servicemen did not steal the show, however. Patients with overactive thyroid glands, goiters in the layman's terms, who can now be helped by a medicine instead of an operation will cheer the fact that one of the awards went to the discoverer of this medicine, Dr. Edwin B. Astwood of Tufts Medical College, Boston.

All of the researches, from the medical control of overactive thyroids to the new way of growing polio viruses that laid the practical foundation for the vaccine now on trial, to the discovery of streptococci that cause kidney disease and the use of antibiotics for prevention of strep-induced rheumatic fever, have widespread influence toward longer life and better health for people of all ages.

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## METEOROLOGY

# Globe Weather Model

Colored dyes and aluminum powder swirling in glass sphere will enable scientists to watch in the laboratory the eddies and currents in our atmosphere.

► COLORED DYES and aluminum powder swirling in a glass sphere two feet in diameter will soon be used to picture the world's weather patterns.

Dr. Dave Fultz of the University of Chicago designed the sphere, which is now being built to his order.

To study, under controlled conditions, what makes our weather, Dr. Fultz has made a laboratory model of the atmosphere in a dishpan. The pan can be heated or cooled either from the outside, which represents the equator, or from the center, which represents the North Pole.

The pan spins on a rotating table rather like a phonograph turntable. Dyes to color the water and aluminum powder sprinkled on its surface allow scientists to watch the large-scale currents and eddies and atmospheric flow.

Dr. Fultz is now anxious to start swirling water in his two-foot spherical model because he wants to check whether the various weather patterns he has found in the dishpan model, which is flat, are also found in the full globe model.

Therefore, one of the first studies he will make will be of the so-called planetary waves, a world-circling band of air 30,000 to 40,000 feet above the earth's surface.

Meteorologists have learned that this band of air tends to fall into certain average patterns that can remain fairly stationary for as long as one or two months, although details change rapidly from day to day. The number and other characteristics of the gigantic wave crests and troughs of these patterns seem to control the earth's weather.

Although the crests and troughs gradually shift position over a period of time, when they are fairly stationary, the weather at the earth's surface seems to repeat itself. These repeating weather cycles are sometimes every five days, sometimes every seven days, sometimes every ten days, sometimes longer.

They give credibility to the worker's often-heard moan that it rains every weekend.

The repeating weather cycles break up as the planetary wave band slowly changes until it finally assumes a new pattern that then remains fairly stable for another month or two.

Sometimes the planetary wave encircling the earth has only four crests and four troughs. At other times, it has five or more.

In his dishpan study of the weather, Dr. Fultz has found that, as the number of crests and troughs changes, differing types

of patterns occur in the swirling water. These patterns, in a general way, resemble observed weather patterns.

Dr. Fultz can change the number of crests and troughs of the planetary wave by changing the speed of the rotating dishpan, by varying the rate of heating, by introducing obstacles to represent mountains and other geographical features.

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## GEOLOGY

## Giant Wombat Bones Plundered by Visitors

► VALUABLE RELICS of the prehistoric diprotodon or giant wombat have been destroyed by visitors to Brewarrina in the west of New South Wales.

The fossil expert at the Sydney Museum, H. D. Fletcher, found some of the bones were missing when he examined the find on the bank of a creek. Four lots of diprotodon bones, about half a complete diprotodon skeleton, were found in one spot.

Downstream two other lots of bones, apparently those of a palorchestes or giant

kangaroo were discovered. Due to deterioration, Mr. Fletcher said it was impossible to estimate the size of the animals.

No complete palorchestes skeletons have been recovered, but indications are that they were 10 feet high sitting and about 12 feet in fighting position. It is usual for diprotodon relics to be found near those of palorchestes.

Age of the Brewarrina relics is estimated at between 20,000 and 500,000 years.

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## ASTRONOMY

## New Comets Not Unusually Numerous

► EVEN THOUGH it may seem as if a very high number of new sky objects have been spotted in the last two months, comets are not being discovered in more than the usual number this year.

The greatest number of comets observed in one year was 22 in 1947. So far this year, astronomers have found only eight new comets, and they predict that the 1947 record will not fall in 1954.

Because of new fast cameras, such as the wide-eyed Schmidt, comets much fainter than those that could be seen ten years ago are now being spotted. Astronomers estimate that it takes about 120 hours of searching to locate one new comet.

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On the basis of one pound of coal per kilowatt hour of electricity, the average American family consumes 2,100 pounds of coal annually.



**THE CORPORAL**—One of the Army's newest guided missiles is this one shown on its launching device. This missile is a surface-to-surface weapon which will carry either atomic or high-explosive warheads and will travel toward its target at several times the speed of sound, propelled by a rocket motor.

## OPHTHALMOLOGY

**Electronic Magnet to Take Foreign Body From Eyes**

► IN THE future, eye specialists may use an electronic magnet to remove bits of some foreign materials that get into eyes.

A device for doing this is now in development at the Army Medical Center, Washington, Col. John H. King announced at the International Congress of Ophthalmology in New York.

The electronic magnet, when perfected, will be used to remove fragments of metals other than iron. The ordinary magnet does not attract silver, aluminum, brass, copper and various other metals.

Eyes penetrated by such substances have generally been lost in spite of strenuous efforts to save them. Such non-iron fragments of metals caused 25% of the eye injuries from foreign objects suffered by soldiers in the Korean war.

The new electronic magnet has not yet been used on human eyes and will not be until it has been made more efficient, Col. King said.

It was developed by a research team consisting of Col. King and Capt. William C. Owens, Drs. Alfred A. J. Den and M. Noel Stow, and Mr. William Vail Lovell of the Lovell Research Laboratory, Sanford, Fla.

Science News Letter, October 9, 1954

## CHEMISTRY

**Lightweight Fuels May Solve Smog Problem**

► DEVELOP "LIGHTWEIGHT" fuel for our automobiles and we may lick the smog problem in Los Angeles and other large American cities, it is suggested by Dr. G. Ross Robertson, professor of chemistry at the University of California at Los Angeles.

Many motor experts consider it impractical to remove smog-producing chemicals from exhaust gas. A more radical proposal is to redesign the motor fuel to eliminate heavier components, particularly the large amounts of material with molecular weights of 150 to 200.

Such heavy fuel often escapes combustion, Dr. Robertson points out, and is thrown out into the atmosphere in a more or less chemically damaged condition, causing smog.

If motor fuel could be changed to lighter compounds with a molecular weight of 50 to 55, such as are found in butane and propane, the problem might be solved. These fuels could be made to burn efficiently and leave nothing but carbon dioxide and water.

Engineers say that redesign of motors to burn such fuel would not be too much of a problem. A pressure tank to contain the liquid petroleum gas would have to replace present air-vented gasoline tanks.

"The problem of converting gasoline refineries to liquid petroleum gas production would not be simple," Dr. Robertson declared. "Both miles per gallon and miles

per dollar would be seriously involved. But unless exhaust gas can be cleaned up, we may be forced to resort to fuel alteration."

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## AERONAUTICS

**Helicopters Draw New Passengers**

► THE HELICOPTER is whipping up a new clientele for a Belgian airline.

Sabena Belgian Airlines report that 15% of their helicopter passengers have never flown before. Company officials attribute this partly to the helicopter's novelty.

A survey of passengers using the helicopters revealed 60% were flying for their "amusement or pleasure," 56% for "rapidity of connections between cities," 25% for "low flying countryside sightseeing" and seven percent for the "novelty."

The company inaugurated the world's first international helicopter services Sept. 1, 1953, and has lifted nearly 18,000 passengers since then.

Science News Letter, October 9, 1954

## ARCHAEOLOGY

**Greenland Whalebone 8,500 Years Old**

► A PIECE of whalebone from permanently frozen ground near the U. S. Air Force base at Thule in northwestern Greenland has been dated 8,500 years old with a possible error of 200 years one way or the other.

This is one of the first samples of geological and archaeological interest measured by the new U. S. Geological Survey radiocarbon measurement laboratory. It is reported by Dr. Hans E. Suess in *Science* (Sept. 24).

Science News Letter, October 9, 1954

## TECHNOLOGY

**Uranium Hunt by Air Is Cheap and Effective**

► FLYING prospectors have proved that uranium hunting from the air is a cheap, effective method of finding this valuable A-bomb material.

Airborne surveying of radioactive deposits has yielded millions of dollars worth of uranium, Royal S. Foote, chief of the U. S. Atomic Energy Commission's Geophysical Exploration Branch, told the American Mining Congress in San Francisco.

At a low altitude, outcrops holding as little as one-tenth of one percent uranium in the ore can be spotted if the deposit is several hundred square feet in area, he said. Smaller deposits can be detected if the outcrop contains a higher percentage of uranium.

Between 200 and 500 feet, an airborne survey should show all outcrops having areas larger than 1,000 square feet, but the "grade" of uranium must be not less than two-tenths of a percent.

Science News Letter, October 9, 1954

**IN SCIENCE**

## TECHNOLOGY

**Box of Tomato Juice Becomes a Reality**

► A HOUSEWIFE can soon ask her grocer for a box of tomato juice.

Tomato juice powder, newest addition to a growing list of fruit juice powders, has been developed by the U. S. Department of Agriculture.

The powder can be quickly restored to liquid tomato juice simply by adding water. It is processed in one of two ways: by vacuum drying the pulp and the liquid separately and then mixing the two powders, or by directly vacuum drying tomato paste.

The saving in storage and freight costs is expected to be responsible for wide civilian and military usage of the new powdered juice.

Paradoxically, there is no saving in making dry tomato juice rather than the present canned juice method. It costs as much to take the water out of the tomatoes for drying as it does to add water to make canned tomato juice.

Science News Letter, October 9, 1954

## CHEMISTRY

**Polonium and Actinium Isolated as Metals**

► TWO METALS seldom or never before seen with human eyes were shown to the American Chemical Society meeting in New York by men who had isolated them.

Metallic polonium and actinium, elements discovered by Mme. Curie and her associates in 1898, were obtained in globules about the size of a grain of table salt. They glow in the dark and would be hot to touch if one dared touch them. This amount represents a struggle against the extreme radioactivity of the metal.

Polonium is especially difficult to obtain because it continuously decomposes the water in which its compounds are dissolved. Its activity, continually giving off hearts of helium atoms, is 5,000 times as great as radium. Polonium, however, does not emit the beta radiation that makes radium useful in treatment of cancer.

Occurring in nature in quantities of less than an ounce in 25,000 tons of ore, the two rare elements are now made in atomic reactors.

The two metals were isolated by chemists at the Mound Laboratory of the Monsanto Chemical Co., Miamisburg, Ohio. Metallic actinium was described by Joseph G. Stites Jr. E. Francis Joy made polonium tetra-bromide, and E. Orban and L. S. Brooks described other properties of polonium.

Science News Letter, October 9, 1954



# CE FIELDS

## BIOLOGY

### Lignin, Found in Trees, Made Synthetically

► **LIGNIN**, A plant substance which makes it hard for a human to make a dent in a tree and which is responsible for the hardness, strength and compactness of wood, has been produced synthetically.

Dr. S. M. Siegel, research fellow in biology at the California Institute of Technology, described the laboratory making of lignin to the American Institute of Biological Sciences meeting in Gainesville, Fla.

The biosynthetic lignin is similar to most natural lignins, and almost identical to the lignin of spruce trees.

In his studies of lignin formation, Dr. Siegel has shown that tissue slices from a variety of plants can transform such compounds as eugenol, an aromatic oil found in cloves, into synthetic lignin when the tissues are supplied with the eugenol and hydrogen peroxide, an oxidizing agent formed naturally by most living cells.

In natural plant growth, lignin has been associated with the aging process. Lignin creates cell walls that are resistant to compression, more watertight, tougher and denser than found in younger shoots. The new artificial lignin possesses the same properties as natural lignin.

Lignin has long been troublesome to the wood pulp industry because it makes up half of the wood and has long been considered as waste material.

In recent years, practical pilot plants have been set up to test the use of lignin as adhesive, plastic, a source of organic chemicals, or to replace carbon black in rubber heels and soles.

Science News Letter, October 9, 1954

## NUTRITION

### New Frozen Food Use For Old Oriental Rice

► **WAXY RICE** flour, formerly used only in oriental ceremonial dishes, has solved the problems of frozen and canned pre-cooked food texture.

The discovery that the flour, made from waxy or glutinous rice, improves the stability of these prepared foods was made at the U. S. Department of Agriculture's Western Utilization Research Branch, Albany, Calif.

Frozen cooked foods thickened with ordinary flours, starches or eggs have taken on a curdled look when thawed or heated. Canned foods, thickened in the same manner, tend to become increasingly firm in storage. Use of waxy rice flour, however, prevents this instability in both instances.

It was found that the superiority of waxy

rice flour as a stabilizer in frozen pre-cooked foods is related to the greater spreading out of the starch molecules in waxy cereals than in ordinary cereals.

The U. S. Army Quartermaster Corps has already specified that waxy rice flour be used in all frozen cooked meals containing sauces or gravies purchased for the armed forces.

Recent tests have also shown that the new flour improves the texture of frozen custards, puddings and thickened fillings for cakes and cream puffs.

At the present time, there are more than 50 commercial concerns, as well as the Quartermaster Food and Container Institute that are interested in the unique properties of waxy rice flour.

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## GENERAL SCIENCE

### Chemical Research Gives \$36 Sales Per Dollar

► **RESEARCH** IN chemical industries induces \$36 for each dollar spent, the American Chemical Society meeting in New York was told.

Dr. R. W. McNamee, chemist-manager of research administration of Union Carbide and Carbon Corporation, New York, reported a study made jointly with L. E. Erlandson, of financial records of research by a group of chemical companies during the last 15 years.

The \$36 for one dollar figure was based on the sales from products of research in the fourth through tenth years after completion of research. Profit before taxes was in excess of \$7.20 for each dollar invested in research.

Science News Letter, October 9, 1954

## CHEMISTRY

### Fiber Stretching Gives Clues to New Materials

► **COTTON** AND paper fibers may at times stretch like rubber, and at other times like glass, chemists addressing the American Chemical Society meeting in New York said.

Energy used in stretching the fibers that make up paper and cotton can be measured to give a check on the invisible changes taking place when materials made of these cellulose fibers are treated in manufacturing processes.

Studies of the energy changes when these natural fibers are treated with chemicals help textile scientists develop new fibers whose properties make them more suitable for particular uses. These were reported to the meeting by Dr. Helmut Wakeham of the Textile Research Institute, Princeton, N. J.

How stretching affects the fundamental structure of the cellulose molecule was described by Dr. W. E. Roseveare of the DuPont textile fibers department at Richmond, Va.

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## BIOCHEMISTRY

### Witch Doctors' Snuff Yields Active Chemical

► A **CHEMICAL** that affects nerves, heart and blood vessels has been extracted from a sleep-inducing snuff used by West Indian witch doctors at the time of Columbus.

The snuff is called cohoba. It comes from the seeds of a mimosa-like tree, *Piptadenia peregrina*. However, the active chemical in it is bufotenine, Dr. Verner L. Stromberg of the National Heart Institute has discovered.

Bufotenine is much like a chemical obtained from the venom of tropical toads. Its effect is something like that of the naturally occurring chemical, serotonin, which constricts blood vessels and speeds the heart rate.

Its effect on heart and blood vessels is being studied at the Heart Institute while scientists at the National Institute of Mental Health probe its effects on nerves and mind.

Dr. Stromberg studied cohoba from seeds obtained by the Department of Agriculture from Las Mesas, Puerto Rico, he reports in the *Journal of the American Chemical Society*.

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## MEDICINE

### Saliva May Hold Clue To Anti-Cancer Agent

► **SALIVA** IN the human mouth holds a clue to a possible anti-cancer agent, it appears from studies at Ohio State University's College of Dentistry.

By its continuous cleansing action, saliva itself may check cancer-producing agents in the mouth.

Dr. Steve Kolas suggests this on the basis of studies he has just completed. The finding may explain why cancer of the mouth has not increased in the way lung cancer has parallel with the increase in tobacco consumption, he thinks.

Using mice, he applied a cancer-causing chemical to the roof of the mouth of each mouse, letting the chemical spread to other parts of the mouth and face. Six months later, no cancers or other significant changes had developed in the mouths of the mice, but cancers had developed on the skin of the faces.

The continuous cleansing action of the salivary flow, which diluted and removed the cancer-causing chemical at the same time, is, in Dr. Kolas' opinion, the chief reason why no cancers developed in the mouths of the mice.

However, saliva may contain an anti-cancer agent. None has so far been found but Dr. Kolas believes further search should be made. If such an agent exists and can be isolated, it might not only save the lives of the 5,000 to 6,000 Americans who die each year of oral cancer, but might also have wide applications in the continuing fight on all forms of cancer.

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## ORNITHOLOGY

# Tireless Travelers: Birds

Birds on the wing are a sign of fall. Some fly in de-segregated groups; others are quite exclusive. Some fly 2,400 miles non-stop, use two ounces of fuel.

By HOWARD SIMONS

► BIRDS, THE world's most seasoned and accomplished travelers, are once again heading southward across the United States.

This year, as in the past, a human radar net of ground observers will be looking skyward to witness a phenomenon that has fascinated man for nearly 3,500 years of recorded time.

From the time of Homer, Herodotus and Aristotle, who are credited with being among the earliest bird watchers to keep records, to the present, the why and the how of a bird's migration have remained a mystery.

The origin of bird migration dates back to prehistoric times, and scientists have never yet agreed on what exactly is the triggering mechanism.

One group of ornithologists credits the ice floe that covered the North American continent 25,000 years ago with forcing prehistoric birds to flee southward to seek food and shelter. When the ice receded, the birds returned. Therefore, this group believes, birds have been flying north and south every year from force of habit.

An opposing group of bird experts believes that all birds were living in the tropics, and that overpopulation forced them north to the virgin lands of North America after the ice disappeared.

Both groups believe that migration is now as habitual as drug addiction or smoking.

A new theory has been proposed that the amount of light and the length of day tell the birds when it is time to fly south and time to head north.

How the migrating birds find their way to and from their summer and winter homes is another puzzle, as yet unsolved. To say that the birds use "instinct" merely describes the phenomenon without explaining it. There are many arguments to disprove the theory that birds use familiar landmarks. They have been known, for instance, to find their way in fog.

## Magnetic Field a Guide

Some biologists have suggested that birds are guided by the earth's weak magnetic field. This theory would be stronger if all birds flew in direct north and south lines. However, each kind of bird has its own flight plan.

The problem of when birds migrate is principally one concerning the individual species. Although it is commonly accepted that the mass migrations are in early fall

and early spring, birds are migrating during almost the entire year.

Shore birds are known to begin their migration in July, while goshawks and snowy owls stay at home until midwinter. It is generally accepted that the birds migrating early, return late and those migrating late, return early.

Most small birds, such as rails, orioles, thrushes, warblers and many sparrows, prefer to do their migrating during the nights. It is not unusual, therefore, to find the woods full of birds one fine afternoon and completely abandoned the next morning.

Birds have been falsely credited with all but breaking the sound barrier in their flights. Although a single hunting duck hawk was once clocked at between 165 and 180 miles per hour, few birds average an air speed of 60 miles per hour. The common flying speed for most ducks and geese is about 45 miles per hour, and less for smaller birds.

Observers in the Himalayas have reported seeing storks and cranes some 20,000 feet above sea level, but for the most part, migration altitude is at 3,000 feet or lower.

## Segregation

Segregation is another aspect of migration. Crows, bobolinks and kingbirds fly in their own groups, while swallows, sparrows and blackbirds will travel in mixed groups. Age and sex also play a part in the segregation practices of birds.

In their trips north and south, birds will follow one of four general flyways, wide superairways. The four flyways are called the Atlantic, Mississippi, Central and Pacific.

Some of the smaller birds never travel the flyways, but migrate from their mountain retreats to the warmer valleys just a few miles away. Larger birds, such as ducks and geese, travel 3,000 miles or more.

Most waterfowl can travel 250 or 300 miles in a single, 10-hour day. The Arctic tern is undoubtedly the most energetic of the migrants, traveling 11,000 miles from the tundra of the Arctic to the frozen wastes of the Antarctic.

It has been estimated that more than 100 species of American birds defy the border patrol each year and spend their winters in the West Indies, Central America or South America.

The expense of fuel on these trips is a marvel of efficiency. The Golden Plover makes a 2,400 mile hop, non-stop, from Nova Scotia to South America twice a year. The total journey, one way, takes him 48

hours, and in this time he uses only two ounces of body fat.

To match this, man would have to build a thousand-pound airplane that could average 160 miles on a gallon of gasoline.

However, all is not a pleasure trip for the birds. Each year thousands never reach their destination. They fall prey to animals, reptiles and other birds. Storms take a significant toll, and man-made objects are the cause of still more deaths.

These migratory birds are now protected by law along their flyways, and migration this fall, as in the past, will be a welcome and imaginative sight, to Eskimos in the far north and to farmers and city-dwellers in the south.

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## ORNITHOLOGY

## Rare Trumpeter Swans Now Number 642 in U. S.

### See Front Cover

► THE RARE trumpeter swan's U.S. population now numbers 642 birds, it was announced by Secretary of the Interior Douglas McKay.

The 1954 census, conducted by the U.S. Fish and Wildlife Service and the National Park Service, showed an increase of 65 birds over the 1953 census total of 577. Two of the beautiful birds are shown on the front cover of this week's SCIENCE NEWS LETTER.

Thought to be extinct 50 years ago, the trumpeter swan numbered only 73 in 1935 when the Government established the Red Rocks Lakes Migratory Waterfowl Refuge in southwestern Montana in an effort to save the birds.

Although it has been unlawful to kill trumpeter swans since 1924, there was little done to protect them until 1935, when the Red Rocks refuge was set in operation. This year's census revealed that more than half of the present living birds, 355, were found at the Montana refuge.

A breakdown by states showed: Montana, 452; Wyoming, 130; Idaho, 45; Oregon, 8; Nevada, 7.

The trumpeter swan is a huge bird, white and tinged with a rusty color on its head. It reaches an over-all length of five feet. Because of its great beauty and size, the trumpeter swan was a favorite of reckless and remorseless hunters.

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Chicken flavor is diminished when the raw bird is soaked in cold water.

The booming chemical industry consumes about 68% of the 20,000,000 tons of salt produced annually; people eat only three percent of the output.

## ZOOLOGY

NATURE  
RAMBLINGS

Woodchuck

► THIS IS the time of year when you finally expect to learn how much wood a woodchuck really chucks, assuming the pesky animal could chuck wood after spending all summer digging tunnels through your garden.

The answer is "Not any." As a timber handler, the woodchuck is a decided flop. He bothers himself not at all in laying in a winter's supply of fire wood, for he has a much better way to keep warm.

By dint of all the vegetables he has pilfered, he is a veritable butter-ball by the time frost begins to sting his ears. His layers of fat will insulate him from the cold and supply enough energy to stay alive until another spring brings a new crop of good things to eat.

It is amazing the fine, resounding reputation the woodchuck has built up for himself. Not only is he considered a lumberjack of the Paul Bunyan school, but under an alias, the groundhog, he is presumed to be an infallible weather prognosticator.

Each year on Feb. 2 his opinion on the amount of winter remaining is eagerly sought. Yet there is no authentic case on record of his ever having paid attention to his shadow, even when it was in plain sight. "Groundhog" forecasts might just as well be made by flipping a coin.

The woodchuck, or groundhog, or marmot—call him what you please—is one of the medium-sized rodents, kin to the rabbit and the rat. He has, however, neither the long ears of the rabbit nor the long tail of the rat. He resembles instead his other cousin the guinea-pig.

It is surprising how many rodents are given false positions in the pig pen by colloquial nomenclature—groundhog, guinea-pig, and porcupine for examples. The woodchuck seems to have been given a double pig-christening for "chuck" is an English country dialect word meaning a small pig or shoat.

Although there is no connection in zoology's family tree, the woodchuck does vie with his ham-and-bacon namesakes as an eater and sleeper. He breakfasts heavily, lunches moderately and dines inordinately

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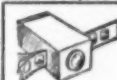


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on the most appetizing green stuff that he can find. After sleeping from dusk to dawn, he takes a long nap in the morning and a shorter one in the afternoon.

Then, as winter approaches, he retires with a yawn and settles down to a real

sleep. Like most of his rodent relatives, the woodchuck is a burrower, though not at all a particular one. Once he has dug a home he sleeps in it, rather than expending any effort in improving it.

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## Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ABSTRACTS OF SCIENTIFIC PAPERS, Second World Congress of Cardiology and the 27th Annual Scientific Sessions of the American Heart Association, Inc.—*American Heart Association*, 559 p., paper, \$3.00. For the first time communication and mutual understanding among the delegates to an international scientific congress was facilitated by circulating abstracts of the papers in the easy-to-read international language Interlingua.

ACCENT ON FORM: An Anticipation of the Science of Tomorrow—Lancelot Law Whyte—*Harper*, 198 p., \$2.75. A British physicist raises the question, "What kind of universe is this into which we are born?"

ADMINISTRATIVE MEDICINE: Transactions of the Second Conference, December 8, 9, and 10, 1953, Princeton, N. J.—George S. Stevenson,

Ed.—*Josiah Macy Jr. Foundation*, 164 p., illus., \$3.00. Discussing this problem from varied points of view.

THE ANATOMY OF PERSONALITY—Donald K. Adams—*Doubleday*, Doubleday Papers in Psychology, 44 p., illus., paper, 85 cents. A basic exposition of the application of the field-theoretical perspective to personality, the first since that presented by the late Kurt Lewin.

THE ANIMAL KINGDOM: The Strange and Wonderful Ways of Mammals, Birds, Reptiles, Fishes and Insects. A New and Authentic Natural History of the Wildlife of the World—Frederick Drimmer, Ed. in Chief—*Greystone*, 2062 p., three volumes, illus., \$17.50. The work of seven naturalists on the staffs of the American Museum of Natural History and the New York Zoological Society, this book is intended to fill the place of the old standby "Wood's Natural History."

ART AND PLAY THERAPY—Emery I. Gondor—*Doubleday*, Doubleday Papers in Psychology, 61 p., illus., paper, 95 cents. A clinician describes a particular method used to work with children and to gain an understanding of their problems and needs.

ART OF ASIA—Helen Rubissow—*Philosophical Library*, 237 p., illus., \$6.00. Man's most authentic record, the author comments, is his art. In deep caves beneath the earth and on the rocks of high mountain tops, early man has left fragments of his story.

THE CHEMICAL PATHOLOGY OF ANIMAL PIGMENTS: A Symposium Held at the London School of Hygiene and Tropical Medicine on 20 February 1954—R. T. Williams, Ed.—*Cambridge University Press*, 84 p., illus., paper, \$2.75. Devoting special attention to porphyrin and heme metabolism.

THE CONCEPT OF SCHIZOPHRENIA—W. F. McAuley with foreword by John H. Ewen—*Philosophical Library*, 145 p., \$3.75. Surveying our

present knowledge of this most common of all mental diseases and evaluating the importance of environment and heredity.

THE DISTRIBUTION AND ABUNDANCE OF ANIMALS—H. G. Andrewartha and L. C. Birch—*University of Chicago Press*, 782 p., illus., \$15.00. Discussing where the various animals are to be found over the earth's surface and the niche each occupies in the animal community.

THE DRAGONFLY LARVA—R. E. Snodgrass—*Smithsonian*, 38 p., illus., paper, 35 cents. Metamorphosis, the author reminds us, still baffles the understanding.

THE ENCYCLOPEDIA OF CHILD CARE AND GUIDANCE—Sidonie Matsner Gruenberg, Ed.—*Doubleday*, 1016 p., illus., \$7.50. An alphabetical list of topics parents might wish to look up from "Abilities" to "Youth Organizations," followed by chapters of guidance on child care. The editors recommend the book especially to grandparents to help them bring themselves up-to-date.

EXHAUST FOR HOT PROCESSES—W. C. L. Hemmick—*Mellon Institute*, 8 p., illus., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Convection currents and thermal head are two of the influences analyzed here.

FACTORS AFFECTING THE COSTS OF HOSPITAL CARE: Volume 1 of Financing Hospital Care in the United States—John H. Hayes, Ed.—*Blakiston*, 300 p., illus., \$4.00. The first of three volumes that will contain the detailed report of the Commission on Financing Hospital Care. Lower costs, in the opinion of the commission, should not be achieved by sacrificing hospital services.

GENERAL CHEMISTRY—W. Norton Jones Jr.—*Blakiston*, 907 p., illus., \$6.50. A text for first-year college students, designed to be suitable for those who have had high-school chemistry and those who have not.

GENETICS, BIOLOGICAL INDIVIDUALITY AND CANCER: Lane Medical Lectures—Clarence C. Little—*Stanford University Press*, Stanford University Publications University Series Medical Sciences, Volume VII, 115 p., illus., paper, \$2.50. Summing up the basic information on the nature of cancer growth.

GROWING WITH THE YEARS—Thomas C. Desmond and others—*New York State Joint Legislative Committee on Problems of the Aging*, 159 p., illus., paper, free upon request direct to publisher, 94 Broadway, Newburgh, N. Y. A group of articles by various specialists discussing ways of making the later years of life happier and more rewarding to the individual and to society.

HOW CHILDREN CAN BE CREATIVE—Wilhelmina Hill, Helen K. Mackintosh and Arne Randall—*Govt. Printing Office*, Office of Education

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Bulletin 1954, No. 12, 23 p., illus., paper, 15 cents. Showing that creative activity by no means needs to be confined to use of paint brush or musical instrument.

CEREBERS AND JUNGLES—Shirley Carpenter and Marie Neurath—*Hanover House*, 30 p., illus., \$1.00. Colored shadow relief maps and photographs give children a beautiful introduction to the subject of climate.

INTERNATIONAL REVIEW OF CYTOLOGY: Volume III—G. H. Bourne and J. F. Danielli, Eds.—*Academic*, 530 p., illus., \$9.50. Chapters contributed by 16 scientists.

THE MARCHING WIND—Leonard Clark—*Funk & Wagnalls*, 368 p., illus., \$5.00. An exciting travel story about a previously unexplored and unexplored region in the heart of Asia. The height of the Amne Machin peak, here described, is the subject of dispute as is its very existence, according to the author.

MARKETING: The Yearbook of Agriculture 1954—Alfred Stefferud, Ed.—*Govt. Printing Office*, 506 p., illus., \$1.75. Discussing many aspects of the problem of getting food from the farmer's land to your table.

MINERALS FOR ATOMIC ENERGY: A Guide to Exploration for Uranium, Thorium and Beryllium—Robert D. Nininger—*Van Nostrand*, 367 p., illus., \$7.50. The purpose of this book is to expand on and complete the information in the AEC's booklet for amateur uranium prospectors. Telling what to look for, where to look, how to look and what to do with the ore if you find it.

MY LIFE WITH THE MICROBES—Selman A. Waksman—*Simon and Schuster*, 364 p., illus., \$5.00. The Nobel tells the dramatic story of his early life in Russia and the events that followed his coming as an immigrant boy to this country in search of education and an opportunity to make life healthier and richer for others.

MODERN PHYSICS FOR THE ENGINEER—Louis N. Ridenour, Ed.—*McGraw-Hill*, 499 p., illus., \$7.50. Each chapter is contributed by a recognized authority in the particular field covered.

MOUNTAINS AND VALLEYS—Shirley Carpenter, Marie Neurath and Stewart Irwin—*Hanover House*, 30 p., illus., \$1.00. The beautiful shadow relief maps and isotypes in color give children a 3-D view of the surface of the world we live in.

THE NEW WARFARE—Brigadier C. N. Barclay—*Philosophical Library*, 65 p., \$2.75. Developing the thesis that today's warfare consists of our current state of a battle of propaganda, underground activities, armed threats and limited war by proxy.

ON THE NATURE OF PSYCHOTHERAPY: Basic Definitions and Assumptions for Students of Psychology and Medicine—Arnold Bernstein—*Doubleday*, Doubleday Papers in Psychology, 36

p., paper, 85 cents. Explicit statements of basic assumptions intended to reduce semantic confusion for students.

THE PRACTICE OF SANITATION—Edward Scott Hopkins and Wilmer Henry Schulze—*Williams & Wilkins*, 2d ed., 466 p., illus., \$8.00. The gratifying increase in life expectancy at birth in recent years has been due in considerable part to improvement in sanitation.

THE REAL BOOK ABOUT THE SEA—Samuel Epstein and Beryl Williams—*Garden City Books*, 223 p., illus., \$1.50. A book for boys and girls about the open sea that covers three quarters of the surface of our globe.

RELIGION AND SOCIETY—Elizabeth K. Nottingham—*Doubleday*, Doubleday Short Studies in Sociology, 84 p., paper, 95 cents. Intended to give the sociology student as well as the layman a basic point of view regarding the part played by religion in human societies.

SPECTROGRAPHIC EXAMINATION OF THE OCCURRENCE OF CERTAIN ALKALI ELEMENTS IN CALCITE MARBLES—M. P. Lelong and Edwin S. Hodge—*Mellon Institute*, 7 p., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. The alkali content, important in connection with weathering, was found to follow a pattern dependent upon geographical origin.

THEORETICALLY REQUIRED EXHAUST RATES FOR DUST CONTROL IN BULK MATERIAL HANDLING SYSTEMS—W. C. L. Hemion—*Mellon Institute*, 3 p., illus., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Each individual particle moving

through air tends to drag air with it. The author has calculated the resistance due to air drag.

THE WONDERFUL WORLD: The Adventure of the Earth We Live On—James Fisher, and F. H. K. Henrion, Art Editor—*Hanover House*, 68 p., illus., \$2.50. Geography, geology, climatology and related subjects made attractive for children by beautiful color pictures.

ZOO EXPEDITIONS—William Bridges—*Morrow*, 191 p., illus., \$3.50. A delightful book for the armchair explorer and lover of nature.

Science News Letter, October 9, 1954

#### MARINE BIOLOGY

### Try Raising Oyster Larvae in Cocks

► OREGON'S NATIVE oyster industry may be revived, if attempts to raise oyster larvae in 12-gallon cocks prove successful.

W. P. Breese is trying to do this at Oregon State College's marine research laboratory at Yaquina Bay. Conditions in the bay are just right for natural seeding only about one year in four, he said.

If the oyster can be grown satisfactorily in cocks and transplanted, Oregon commercial oyster populations in many bays could be boosted.

Science News Letter, October 9, 1954

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## PSYCHOLOGY

# Two-Way Conditioning

Soft music or lovely paintings while you eat good food makes you enjoy the art, but later the art in turn makes your mouth water.

► WHEN YOU sit at a delicious luncheon and listen to music your attitudes will change in two directions—toward the music and toward the food.

This is indicated by new experiments reported by Dr. Gregory Razran of Queens College in the *Journal of Experimental Psychology* (Oct.).

Dr. Razran gained prominence some years ago among his colleagues for what came to be known as Razran's Luncheon Technique. That was when he found scientific confirmation for what business men have concluded on the basis of experience, that the big deal discussed with a prospect over a fragrant, juicy steak was much more likely to go over than if it were proposed in the office.

Now Dr. Razran finds that not only do you tend to develop a liking for the soft music you listen to during a meal, but when you hear the music later it will probably make your mouth water and evoke a food-orientated state of mind. This probably means that when the business man's client comes back and a new business deal is brought up, the client will immediately want to go to lunch.

To make the new discoveries, Dr. Razran modified his luncheon technique somewhat. The 20 college students taking part were invited to, not one, but a series of free lunches where music was played or pictures shown. During these meals, they were not distracted from enjoyment of the food by being required to make any decisions.

On the day following the last luncheon, they were gathered in the laboratory with

another group who had not been at the luncheons, for comparison.

While the music was played or pictures shown, they were then asked to find words to rhyme with a list of given words, to unscramble scrambled words, or to tell what the music or picture made them think of.

The luncheon guests tended to find rhyming words that had to do with foods or eating, they could unscramble a word much faster if it was the name of a food, and the music or picture generally reminded them of something related to eating.

The difference between the responses of the luncheon guests and the other students was significant.

What was "conditioned" or learned from the linking of music or art with eating, Dr. Razran concludes, was not so much a sensation or particular motor reaction as it was a generalized attitude or frame of mind that is regarded as basically unconscious.

Dr. Razran has coined a new term for it, "cognitive conditioning."

Science News Letter, October 9, 1954

## TECHNOLOGY

## Pill of Strontium 90 Controls Steel Rolling

► A PILL-SIZED piece of radioactive element, obtained from the Atomic Energy Commission, is being used as the "brain" in a complicated machine that controls the thickness of cold rolled steel.

A piece of strontium 90 the size of an aspirin tablet, contained in a device known as a radioisotope thickness gauge, is able to detect very slight variations in the thickness of sheet steel and, by means of electrical signals, activate control equipment that instantly adjusts the 2,000,000-pound compressive force of the wringer-like roll-

ers through which the continuous ribbon of steel passes.

This method of determining steel thickness is being used in one of Republic Steel Corporation's plants by Republic technicians, with the help of consulting physicists.

The strontium 90 does its detective work from within a small lead-armored capsule. This container, mounted below the moving ribbon of steel, beams beta rays from the speck of strontium 90 through the sheet steel. Above the moving steel is an ionization chamber about the size of a tobacco can. This chamber receives beta ray emanations through the steel. These emanations are strong or weak in proportion to the thickness of the metal.

Through elaborate electronic equipment, the beta ray signals control the "squeeze" of adjoining heavy rollers, which correct off-standard variations in thickness to within .0005 of an inch.

Science News Letter, October 9, 1954

No large body of land on earth is separated by more than 290 miles from some other body of land.

# Questions

**BOTANY**—What natural hybrid has persisted in being different from either parent? p. 229.

☐ ☐ ☐

**HERPETOLOGY**—What creature played a role in the Caribbean like that of the American buffalo on the Great Plains? p. 228.

☐ ☐ ☐

**MEDICINE**—How can a balloon be used to aid heat stroke victims? p. 230.

☐ ☐ ☐

**METEOROLOGY**—How long will the hurricane season last? p. 229.

☐ ☐ ☐

**ORNITHOLOGY**—How many trumpeter swans survive in the United States? p. 234.

☐ ☐ ☐

**PSYCHOLOGY**—In what two ways do your eyes perceive depth? p. 228.

☐ ☐ ☐

**PUBLIC HEALTH**—Why do health officers expect an influenza epidemic this winter? p. 227.

☐ ☐ ☐

Photographs: Cover, Fish and Wildlife Service; p. 227, University of Florida; p. 229, Harvard University; p. 231, Firestone; p. 240, Davis and Geck.

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**CLOTHES LOCKERS** for the office yield compact, safe storage for employees' apparel and valuables. One rack accommodates 17 persons. It consists of a 30-inch coat rod surrounded on sides and top by individual lockers for hats, purses and parcels. Each locker has its own number plate and padlock attachment.

Science News Letter, October 9, 1954

**CARRY-ALL BAG** for men is a "22-inch oversize" with an easy-to-get-at side pocket of briefcase size for papers. It is covered with a special plastic that does not show scuff marks and that resists attack by the elements. The bag can be locked closed with its heavy-duty slide fastener.

Science News Letter, October 9, 1954

**BALL HOLDER** clips to a golfer's belt and firmly grips two golf balls, a tee and a scoring pencil. Made of a sturdy butyrate plastic, the device is lightweight and will not rust after being rained upon.

Science News Letter, October 9, 1954

**BASEBALL-GLOVE ASHTRAY** is about seven inches in diameter and has a ceramic center that holds dozens of cigarette butts and many ashes. The glove is trimmed in pigskin leather, even to rawhide lacing between the fingers.

Science News Letter, October 9, 1954



**CAST FOR** fractured bones often permits the user to return to his job sooner, thus cutting lost-time unemployment. Made of plaster of Paris reinforced with a plastic resin, the cast permits sharper X-ray pictures to be made, and is stronger, lighter and thinner than ordinary plaster casts. It is shown in the photograph. The cast may be washed in water without damage.

Science News Letter, October 9, 1954

**CORK-TO-GLASS CEMENT** permits the do-it-yourself householder to attach cork to decorative glass stoppers, making it possible to use them as primary seals in decanter-type bottles. The cement resists alcohol and will not contaminate the beverage.

Science News Letter, October 9, 1954

**DRYING RACK** for hand-washed stockings and lingerie is made of wood coated with a butyrate plastic and sticks with a heavy-duty adhesive directly to tile bathroom walls. It also grips plaster, wood, steel and glass. The rack has three snag-proof arms that fold against the wall when not in use.

Science News Letter, October 9, 1954

**MOTOR LIFTER** for outboard motors is said to extend greatly the cruising range of small craft by freeing them from dependence upon river channels. The outboard motor can be held at any draft, from full to "dry dock." The attachment is said to cut motor damage 90% when submerged objects are struck.

Science News Letter, October 9, 1954

## Do You Know?

Air pollutants that make human eyes water may also upset the delicate mechanism by which plants absorb water and nutrients.

A practical method has been worked out of analyzing tree prunings to determine the existence of minerals in the earth beneath the trees.

The amount of iron ore required for each ton of pig iron produced in 1953 was the lowest in many years, averaging only 1.691 tons as compared with 1.725 tons in 1951.

The U. S. Geological Survey has developed an accurate method of figuring the reserves of uranium ore deposits of the Colorado Plateau.

Legume cover crops provide maximum nitrogen for the soil when they are plowed under at their peak of growth and are still green and succulent.

Chlorine, an important chemical for human and animal nutrition, has been found vital for healthy plants.

Americans between 30 and 49 drink more coffee per person than any other age group, averaging well over three cups daily.

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6	7	8	9	10

Mail to my address as imprinted at the left.